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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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BLAKELY SOKOLOFF TAYLOR & ZAFMAN
12400 WILSHIRE BOULEVARD
SEVENTH FLOOR
LOS ANGELES, CA 90025-1030

EXAMINER	
WOZNIAK, JAMES S	
ART UNIT	**PAPER NUMBER**
2655	

DATE MAILED: 01/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/688,010	BELLEGARDA, JEROME R.	
	Examiner	Art Unit	
	James S. Wozniak	2655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 November 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,5-21 and 24-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,5-14, 16-21 and 24-38* is/are rejected.

7)☒ Claim(s) *15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 October 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. In response to the office action from 8/19/2005, the applicant has submitted a request for continued examination, filed 11/21/2005, amending claims 1, 20, 31, and 35, while arguing to traverse the art rejection based on the limitation regarding the use of word agglomeration to replace a sequence of words with an associated n-tuple sequence that comprises a vector representation in semantic space of all strings of n consecutive words in the sequence of words *(Amendment, Pages 10-12)*. The applicant's arguments have been fully considered but are moot with respect to the new grounds of rejection in view of Kamiya *(U.S. Patent: 5,122,951)*.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. **Claims 1, 2, 5-21, and 24-38** are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over **Claims 1-24** of U.S. Patent No. 6,208,971 in view of Gorin et al *(U.S. Patent: 5,860,063)*. The addition of a word agglomeration unit to U.S. Patent No. 6,208,971, would have been obvious to one of ordinary skill in the art at the time of invention since the well-known clustering technique of word agglomeration *(clustering meaningful phrases using an agglomerative clustering procedure, Col. 7, Lines 38-39)* is a more specific embodiment of the well-known clustering method referred to in Bellegarda et al (*word sequence classification implemented using clustering algorithms well known to those skilled in the art, Col. 6, Lines 11-17)*. Also, the additional limitations pertaining to semantic anchors from training data, calculation of a distance to determine correlation, and word sequence order would all have been obvious to one of ordinary skill in the art, at the time of invention since, respectively, training allows for the well-known technique of detecting speech from a specific speaker, distance calculation is a well-known means of correlation determination in clustering *(Col. 7, Lines 38-39)*, and semantic relations would be dependent upon word order,

since semantics regards meaning within language, and words must be properly arranged in order to convey meaning in the form of a complete thought or command.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. **Claims 1-2, 5-6, 12, 20-21, 24, 31-32, and 35-36** are rejected under 35 U.S.C. 103(a) as being unpatentable over Gorin et al *(U.S. Patent: 5,860,063)* in view of Kamiya *(U.S. Patent: 5,122,951)*.

With respect to **Claims 1, 20, 31, and 35**, Gorin discloses:

A method and machine readable medium containing instructions for recognizing speech *(Col. 2, Lines 54-66)*, the method comprising:

Recognizing a sequence of words received as a voice command *(meaningful phrase processed by speech recognizer to perform a related task, Col. 2, Lines 25-29)*.

Processing the sequence of words using word agglomeration *(clustering meaningful phrases using an agglomerative clustering procedure, Col. 7, Lines 38-39)*.

Classifying the processed sequence of words as a predetermined command *(classifying clustered phrases related to a command, Col. 7, Line 66- Col. 8, Line 4 and word sequence vectors, Figs. 6 and 7)*.

Gorin does not specifically suggest that agglomerative clustering involves replacing a sequence of words with an associated n-tuple sequence, wherein the n-tuple sequence comprises a vector representation in semantic space of all strings of n consecutive words in the sequence of words, however Kamiya teaches a clustering technique that determines a vector containing semantic information for a sequence of consecutive words within an input phrase *(Col. 7, Line 36- Col. 8, Line 60)*.

Gorin and Kamiya are analogous art because they are from a similar field of endeavor in word clustering and classification. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Gorin with the clustering technique taught by Kamiya in order to implement a stable word association method *(Kamiya, Col. 2, Lines 44-52)*.

With respect to **Claims 2 and 21**, Gorin further recites:

Performing an action corresponding to the predetermined command *(speech input command related to a number of executable actions, Col. 4, Lines 21-45)*.

With respect to **Claims 5 and 24**, Gorin adds:

Classifying comprising: semantically inferring the predetermined command from the associated word n-tuple sequence *(clustering of phrases through semantic relations used in recognizing a voice command, Col. 8, Lines 58-64)*.

With respect to **Claim 6**, Gorin further discloses:

Classifying comprises semantically inferring the predetermined command from the sequence of words *(clustering of phrases through semantic relations used in recognizing a voice command, Col. 8, Lines 58-64)*.

With respect to **Claim 12**, Gorin discloses:

Semantically inferring the predetermined command depends on the order of the words in the processed sequence of words *(clustering of phrase sequences through semantic relations used in recognizing a voice command, Col. 8, Lines 58-64; Figs. 6-7).*

With respect to **Claims 32 and 36**, Gorin in view of Kamiya discloses:

An action generator, coupled to the semantic classifier, to use the vector representation to determine an action to be performed *(classification processor, Fig. 4, Element 30, task objectives, Fig. 4, and speech vectors as taught by Kamiya and applied to Claim 1).*

6. **Claims 7-11, 13-14, 16-19, 25-30, 33-34, and 37-38** are rejected under 35 U.S.C. 103(a) as being unpatentable over Gorin et al in view of Kamiya, and further in view of Bangalore et al *(U.S. Patent: 6,317,707).*

With respect to **Claims 7-8 and 25-26**, Gorin in view of Kamiya teaches the method of determining a command by phrase clustering through semantic relations as applied to Claim 6. Gorin in view Kamiya does not specifically suggest identifying the semantic correlations between a phrase and a sequence of words through a vector distance calculation, however Bangalore teaches a means for determining lexical significance between context word (semantic anchor) and word vectors using a distance calculation (*Col. 1, Line 59- Col. 2, Line 15).*

Gorin, Kamiya, and Bangalore are analogous art because they are from a similar field of endeavor in word clustering. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Gorin in view of Kamiya with the

distance calculation taught by Bangalore in order to provide a means for automatically determining grammatical relationships for command comprehension *(Col. 1, Lines 8-22)*.

With respect to **Claims 9 and 27**, Gorin in view of Kamiya in further view of Bangalore teaches the method of determining a command by phrase clustering through a vector distance calculation as applied to Claim 8. Bangalore further teaches performing clustering according to a shortest distance candidate selection, *(Col. 3, Line 65- Col. 4, Line 3)*.

With respect to **Claims 10 and 28**, Gorin further discloses:

The semantic anchor represents a one of a plurality of predetermined commands *(example of words relating to billing and credit card payment commands, providing semantic information to differentiate similar terms within different contexts, Col. 7, Lines 42-49)*.

With respect to **Claims 11 and 29**, Gorin discloses:

The at least one semantic anchor is derived from a training data *(training of a phrase associated with a command, Col. 7, Lines 10-15, to be used in clustering through semantic relations as applied to Claim 6)*.

Claims 13, 33, and 37 recite subject matter similar to Claim 8, and thus are rejected for similar reasons.

Claims 14, 34, and 38 recite subject matter similar to Claim 9, and thus are rejected for similar reasons.

With respect to **Claim 16**, Gorin further discloses:

The vector representation is an indication of how frequently each of a plurality of word n-tuples occurs within the processed sequence of words *(phrase vectors containing information relating to the phrase occurrence amount, Col. 7, Lines 10-15)*.

With respect to **Claim 17**, Gorin recites:

The vector representation is an indication of how frequently each of a plurality of word n-tuples occurs with respect to the corresponding command *(phrase vectors containing information relating to the number of occurrences within various command classes, Col. 7, Lines 10-15)*.

With respect to **Claim 18**, Gorin discloses:

Each of the plurality of semantic anchors represents a plurality of different ways of speaking the corresponding command *(Fig. 6, and Col. 7 Line 66-Col. 8, Line 4)*.

With respect to **Claim 19**, Gorin in view of Kamiya, and further in view of Bangalore recites the method of clustering similar commands spoken in different manners as applied to Claim 18. Also, it would have been obvious to one of ordinary skill in the art, at the time of invention, that similar phrase clustering as taught by Gorin would also include the clustering of similar commands with variations in word order since those alternate phrases would still be referring to the same command *(as evidenced by Bangalore- the speech clustering method as applied to Claim 8, in which the grammatical content of a word or phrase is analyzed Col. 1, Line 59- Col. 2, Line 15. Therefore word order would not be important since only the grammatical content of a phrase would be analyzed for clustering)*.

With respect to **Claim 30**, Gorin suggests:

Semantically inferring the predetermined command depends on the order of the words in the processed sequence of words *(clustering of phrase sequences through semantic relations used in recognizing a voice command, Col. 8, Lines 58-64; Figs. 6-7)*.

Allowable Subject Matter

7. **Claim 15** is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter:

With respect to **Claim 15**, the prior art of record fails to explicitly teach or fairly suggest and is not obvious in combination with regards to a process for identifying the similarity between a vector representation of a processed sequence of speech command words and a semantic anchor to classify a speech command according to a semantic anchor by calculating the cosine of the angle between the product of the vector representation and a diagonal matrix of singular values and the product of the semantic anchor and the diagonal matrix of singular values and classifying the speech command according to a semantic anchor with a largest cosine value (most similar). The prior art of record fails to explicitly teach or fairly suggest the aforementioned similarity calculation for use in a method for processing speech commands utilizing word agglomeration that replaces a sequence of words with an n-tuple sequence.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Gillis *(U.S. Patent: 6,523,026)*- teaches a means for representing word and phrases in a semantic vector space for clustering.

Calistri-Yeh et al *(U.S. Patent: 6,751,621)*- teaches a method for clustering performed in a semantic vector space.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Wozniak whose telephone number is (571) 272-7632. The examiner can normally be reached on M-Th, 7:30-5:00, F, 7:30-4, Off Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on (571) 272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James S. Wozniak
12/23/2005

W. R. YOUNG
PRIMARY EXAMINER

WAYNE YOUNG
SUPERVISORY PATENT EXAMINER